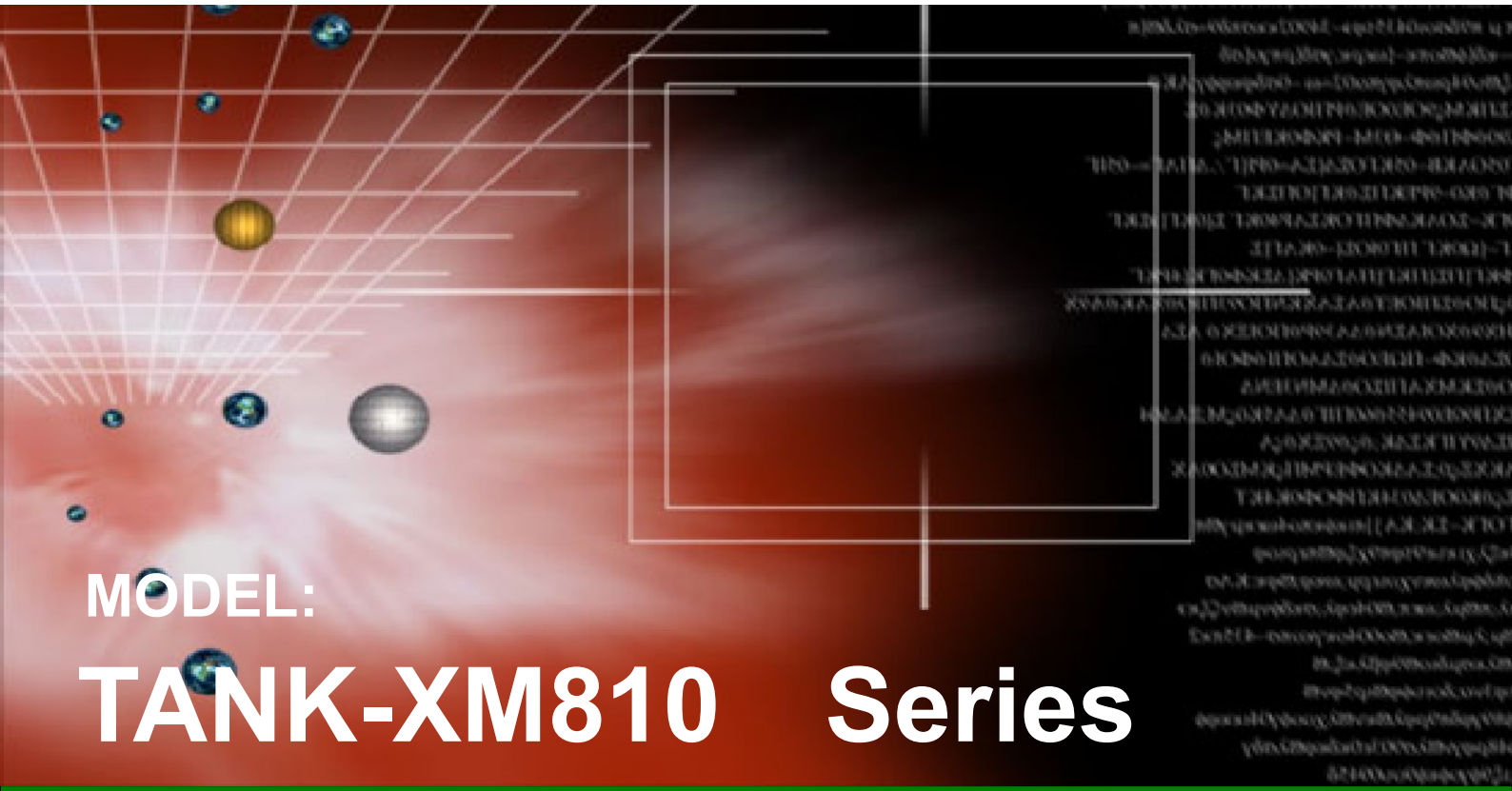
IEI Integration Corp.



MODEL:

TANK-XM810 Series

Embedded System with 10th/11th Generation Intel® Core™ Processor, Two DDR4 Solt, Digital I/O, HDMI+&DP, Two Gigabit Ethernet, RS-232/422/485, RoHS Compliant

User Manual

Rev. 1.00 – May 7, 2022

RoHS Lead Free

Revisions

Date	Version	Changes
May 7, 2022	1.00	Initial release

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Manual Conventions

WARNING

Warnings appear where overlooked details may cause damage to the equipment or result in personal injury. Warnings should be taken seriously.

CAUTION

Cautionary messages should be heeded to help reduce the chance of losing data or damaging the product.

NOTE

These messages inform the reader of essential but non-critical information. These messages should be read carefully as any directions or instructions contained therein can help avoid making mistakes.

HOT SURFACE

This symbol indicates a hot surface that should not be touched without taking care.

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Chapter

1

Introduction

1.1 Overview

Figure 1-1: TANK-XM810 Series

The TANK-XM810 Series is an embedded system for wide range temperature environments. It is powered by the 10th/11th generation Intel® Core™ processor, uses the Intel® Q470 chipset and supports two 260-pin DDR4 SDRAM SO-DIMM modules up to 64GB (8GB memory preinstalled). The TANK-XM810 Series includes one digital I/O port, one HDMI, one DP, Two GbE LAN, six USB 3.2 Gen 1,Two USB 2.0, Two RS-232/422/485,and Four RS-232connectors.

1.2 Model Variations

The model variations of the TANK-XM810 Series are listed below.

Model No.	CPU
TANK-XM810-i3BC-R10	Intel® i3-10320 3.8GHz (up to 4.6GHz, 4-core, TDP 65W)
TANK-XM810-i5AC-R10	Intel® i3-10320 3.8GHz (up to 4.6GHz, 4-core, TDP 65W)
TANK-XM810-i5BC-R10	Intel® i5-10500 3.1GHz (up to 4.5GHz, 6-core, TDP 65W)
TANK-XM810-i7AC-R10	Intel® i7-10700TE 2.0GHz (up to 4.4GHz, 8-core, TDP 35W)
TANK-XM810-i7BC-R10	Intel® i7-10700E 2.9GHz (up to 4.5GHz, 8-core, TDP 65W)

Table 1-1: TANK-XM810 Series Model Variations

1.3 Features

The TANK-XM810 Series features are listed below:

- 10th/11th Gen. Intel® Core™ processor platform with Intel® Q470 chipset and DDR4 memory
- Dual independent displays with high resolution support
- Rich high-speed I/O interfaces
- One 2.5" HDD/SSD SATA 6Gb/s bay
- Great flexibility for hardware expansion

1.4 Technical Specifications

The TANK-XM810 Series technical specifications are listed in Table 1-2

Specifications	
Chassis	
Color	Black C
Dimensions (WxDxH) (mm)	230.6 x 256.04 x 76.2
System Fan	Fanless
Chassis Construction	Extruded aluminum alloy
Motherboard	
CPU	10/11th Gen. Intel® Core™ CPU: Intel® Core™ i7-10700TE 2.0GHz (up to 4.4GHz, 8-core, TDP 35W) Intel® Core™ i5-10500TE 2.3GHz (up to 3.7GHz, 6-core, TDP 35W) Intel® Core™ i3-10320 3.8GHz (up to 4.6GHz,4-core, TDP65W)
Chipset	Intel® Q470/Q470E
System Memory	2 x SO-DIMM DDR4 2933MHz (up to 64GB)
Storage	
Hard Drive	1 x 2.5" HDD/SSD SATA 6Gb/s bay
I/O Interfaces	
USB 3.2 Gen 1 (10Gb/s)	6
USB2.0	2
RS-232/422/485	2 x RS-232/422/485 2 x RS232
Ethernet	Two RJ-45 2 x Intel 2.5GbE by Intel® I225 controller
TPM 2.0	Intel PTT
Digital I/O	12-bit (6-in/6-out)
I/O Interfaces	

Specifications	
Display	HDMI/DP++
Expansions	
M.2	2 x 2280 M key (PCIe x2)
Backplane	Optional
Power	
Power Input	DC jack: 12 V~28 V DC Terminal block: 12 V~28 V DC
Power Consumption	12V @ 8.8A (Intel ® Core™ i9-12900TE with 16GB memory)
Remote Power	1 x 2-pin
Reliability	
Mounting	Wall mount
Operating Temperature	-20°C ~ 60°C with air flow (CPU TDP35W &SSD) -20°C ~ 50°C with air flow (CPU TDP65W &SSD), 10% ~ 95% non-condensing
Storage Temperature	-40°C ~ 85°C, 10% ~ 95%, non-condensing
Operating Shock	Half-sine wave shock 5G, 11ms, 100 shocks per axis (SSD)
Operating Vibration	MIL-STD-810G 514.6C-1 (with SSD)
Weight (Net/Gross)	3.33/3.7 kg
Safety/EMC	CE/FCC
Watchdog timer	Programmable 1~255 sec/min
OS	
Supported OS	Microsoft Windows 10 IoT Enterprise / Windows 11 Linux

Table 1-2: Technical Specifications

1.5 Front Panel

The front panel of the TANK-XM810 Series has the following features (**Figure 1-2**):

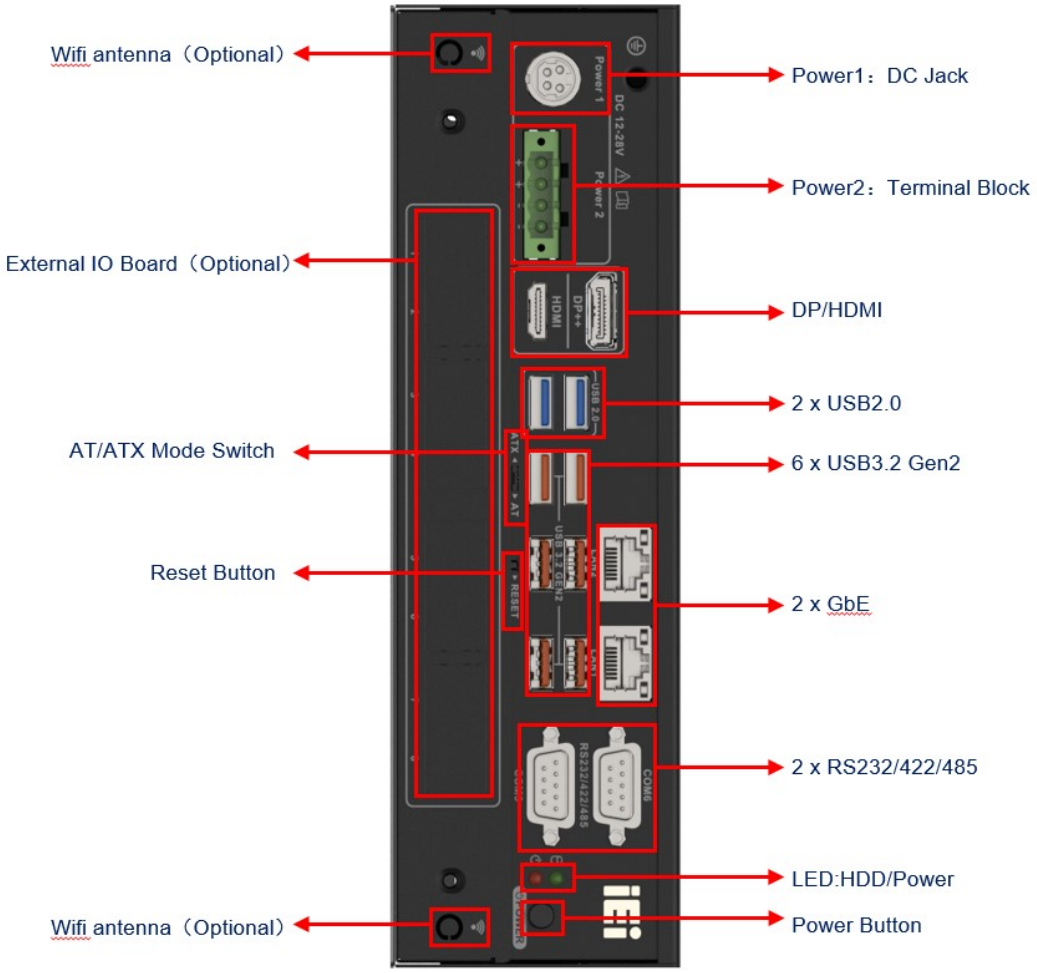


Figure 1-2: Front Panel

1.6 Rear Panel

The rear panel of the TANK-XM810 Series is shown below.

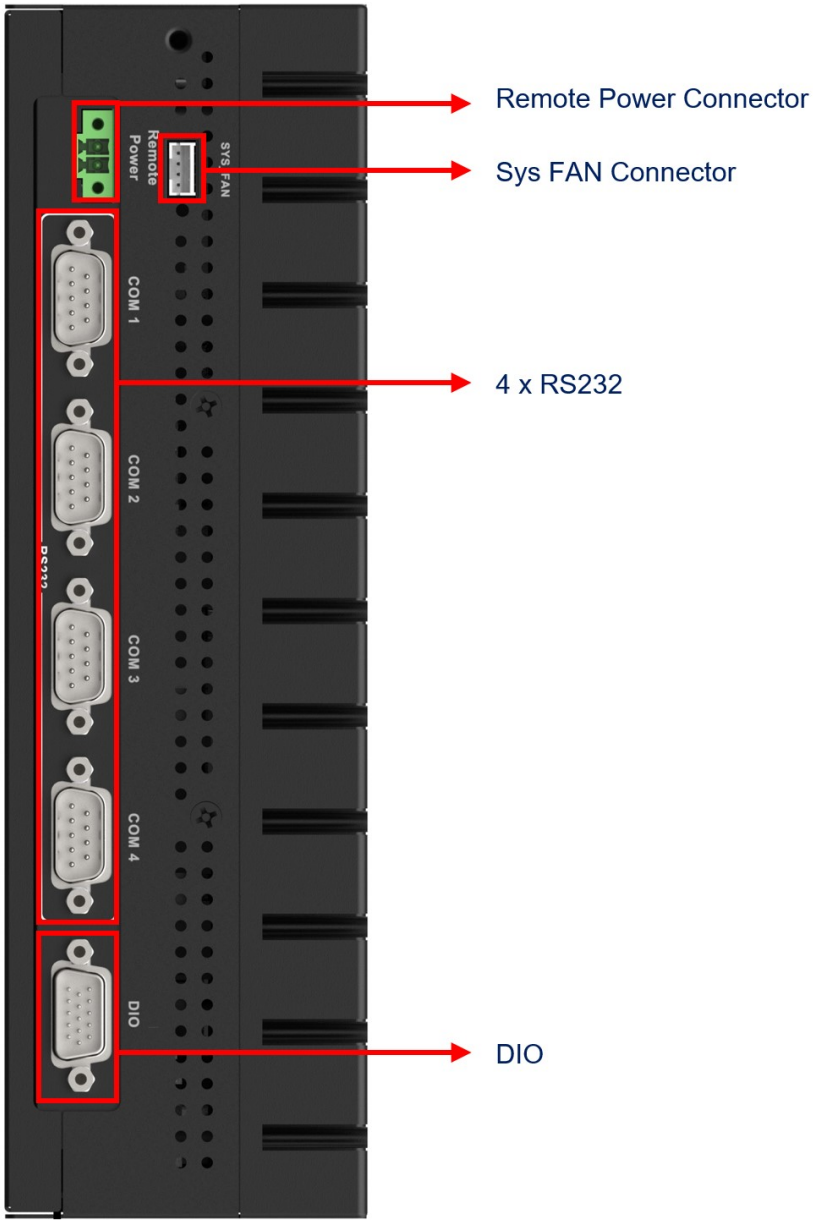


Figure 1-3: Rear Panel

1.7 Physical Dimensions

The physical dimensions of the 错误!未找到引用源。 are shown in **Figure 1-4**.

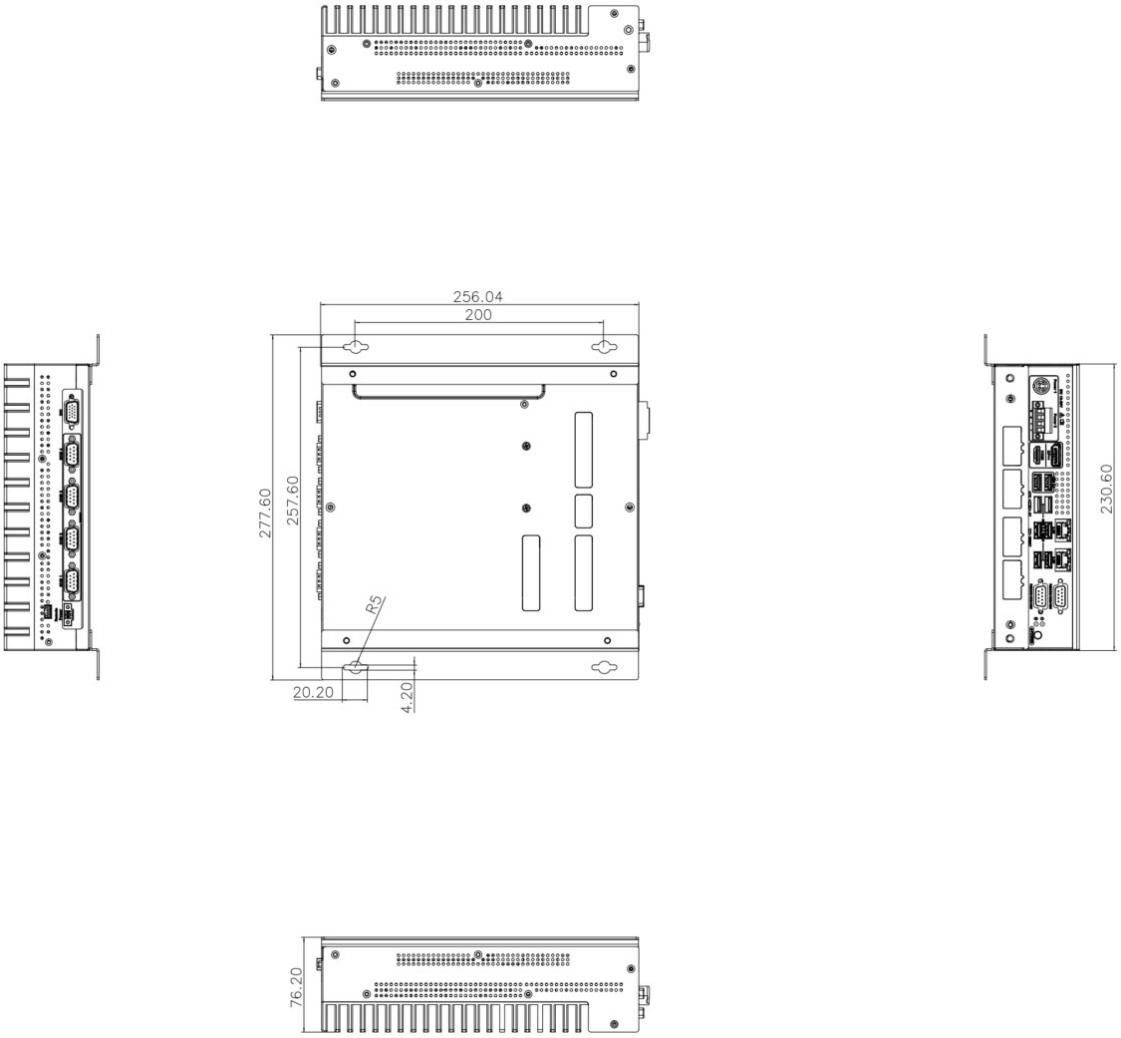


Figure 1-4: Physical Dimensions

Chapter

2

Unpacking

2.1 Anti-static Precautions

WARNING:

Failure to take ESD precautions during installation may result in permanent damage to the TANK-XM810 Series and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the TANK-XM810 Series. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the TANK-XM810 Series or any other electrical component is handled, the following anti-static precautions are strictly adhered to.

- ***Wear an anti-static wristband***: Wearing a simple anti-static wristband can help to prevent ESD from damaging the board.
- ***Self-grounding***: Before handling the board touch any grounded conducting material. During the time the board is handled, frequently touch any conducting materials that are connected to the ground.
- ***Use an anti-static pad***: When configuring the TANK-XM810 Series, place it on an antic-static pad. This reduces the possibility of ESD damaging the TANK-XM810 Series.

2.2 Unpacking Precautions

When the TANK-XM810 Series is unpacked, please do the following:

- Follow the anti-static precautions outlined in **Section 2.1**.
- Make sure the packing box is facing upwards so the TANK-XM810 Series does not fall out of the box.
- Make sure all the components shown in **Section 2.2** are present.

2.3 Unpacking Checklist

NOTE:

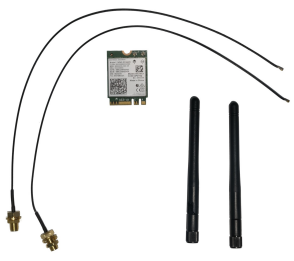
If some of the components listed in the checklist below are missing, please do not proceed with the installation. Contact the IEI reseller or vendor you purchased the TANK-XM810 Series from or contact an IEI sales representative directly. To contact an IEI sales representative, please send an email to sales@ieiworld.com.

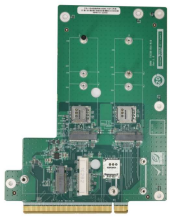
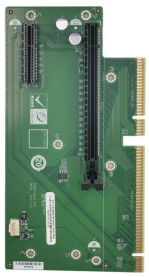
The TANK-XM810 Series is shipped with the following components:

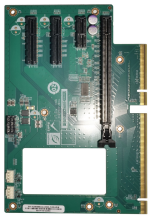
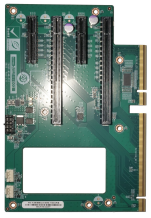
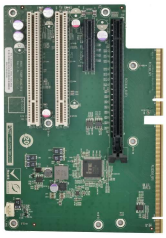
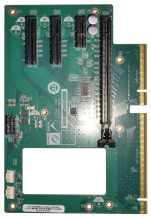
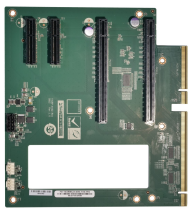
Quantity	Item and Part Number	Image
Standard		
1	TANK-XM810 Series	
2	Mounting brackets	

Quantity	Item and Part Number	Image
Standard		
1	TERMINAL BLOCKS	
1	TERMINAL BLOCK	
1	Chassis screws	

The following table lists the optional items that can be purchased separately.

Optional	
Wi-Fi module (**P/N**: EMB-WIFI-KIT02I3-R10)	

Optional	
Power adapter (**P/N**: 63040-010180-200-RSSS)	
Power cord (P/N: 32000-000002-RS)	
GPOE-XM81-8P-R10	
TXIOB-XM81-A-R10	
TXCBP-XM81-2A-R10	
TXCBP-XM81-2B-R10	

Optional	
TXCBP-XM81-4A-R10	
TXCBP-XM81-4B-R10	
STXCBP-XM81-4C-R10	
TXCBP-XM81-G1-PW-R10	
TXCBP-XM81-G2-PW-R10	
TXC-XM81-3S-R10	

Optional	
TXC-XM81-34S-R10	
TXC-XM81-G1-R10	
TXC-XM81-G2-R10	

NOTE:

1.EMB-WIFI-KIT02I3-R10 needs to be used with TXIOB-XM81-A-R10.

2.TXCBP-XM81 series backplane needs to be used with TXC-XM81 series chassis

Chapter

3

Installation

3.1 Installation Precautions

CAUTION:

The 错误!未找到引用源。 has more than one power supply connection point.

To reduce the risk of electric shock, disconnect all power sources before installing or servicing the 错误!未找到引用源。.

During installation, be aware of the precautions below:

- **Read the user manual**: The user manual provides a complete description of the TANK-XM810 Series, installation instructions and configuration options.
- **DANGER! Disconnect Power**: Power to the TANK-XM810 Series must be disconnected during the installation process, or before any attempt is made to access the rear panel. Electric shock and personal injury might occur if the rear panel of the TANK-XM810 Series is opened while the power cord is still connected to an electrical outlet.
- **Qualified Personnel**: The TANK-XM810 Series must be installed and operated only by trained and qualified personnel. Maintenance, upgrades, or repairs may only be carried out by qualified personnel who are familiar with the associated dangers.
- **Air Circulation**: Make sure there is sufficient air circulation when installing the TANK-XM810 Series. The TANK-XM810 Series's cooling vents must not be obstructed by any objects. Leave at least 5 cm of clearance around the TANK-XM810 Series to prevent overheating.
- **Grounding**: The TANK-XM810 Series should be properly grounded. The voltage feeds must not be overloaded. Adjust the cabling and provide external overcharge protection per the electrical values indicated on the label attached to the back of the TANK-XM810 Series.

3.2 CPU /RAM/ Storage Installation

To install the CPU /RAM/ Storage, please follow the steps below:

Step 1: Remove the 6 screws on the side, and then remove the top cover (Figure 3-1).

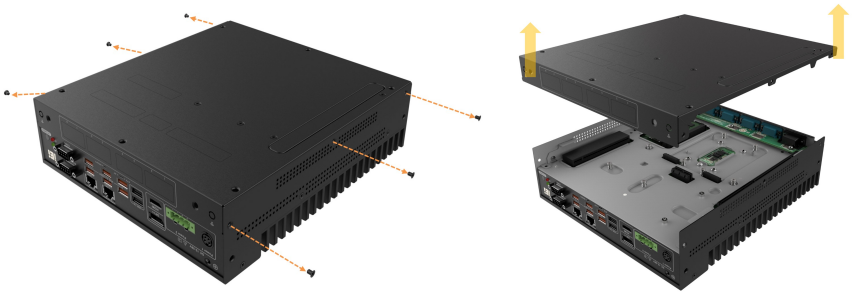


Figure 3-1: Remove the Cover

Step 2: Remove the 11 spring screws on the motherboard, and then take out the motherboard (including the motherboard holder) (Figure 3-2).

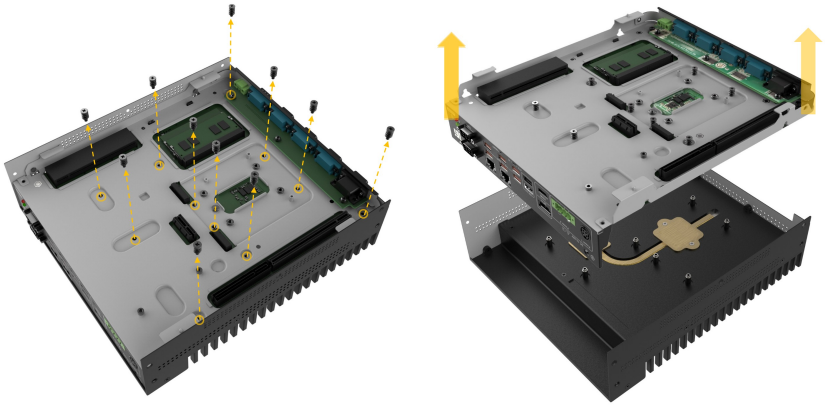


Figure 3-2: Take out the motherboard

Step 3: Pull the lever of the CPU buckle, remove the CPU protection cover, install the CPU at the notch, and fasten the lever down in the buckle (Figure 3-3).

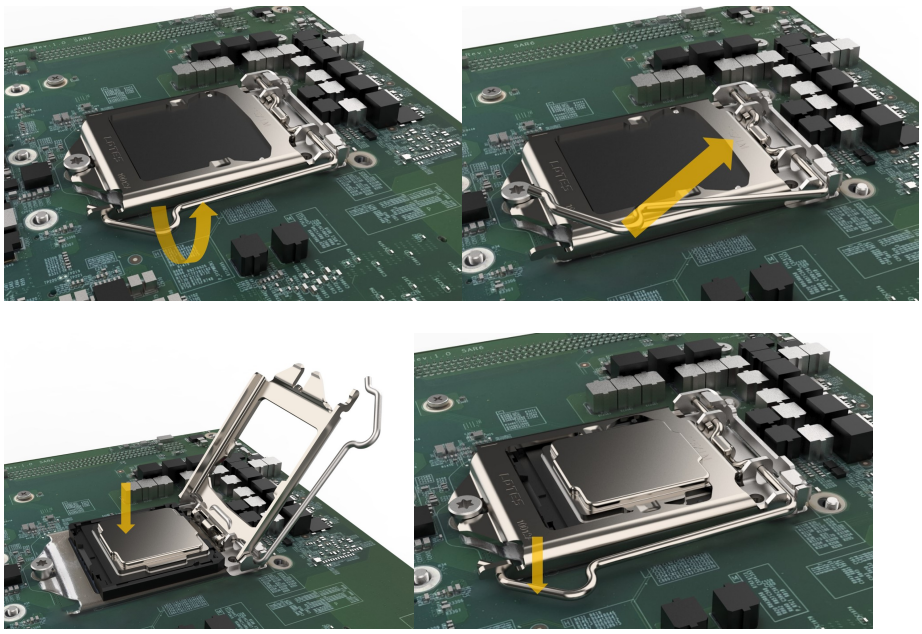


Figure 3-3: CPU Installation

Step 4: Remove the thermal pad from the accessory bag. After disassembling, place the heatsink block on the CPU position(Figure 3-4).

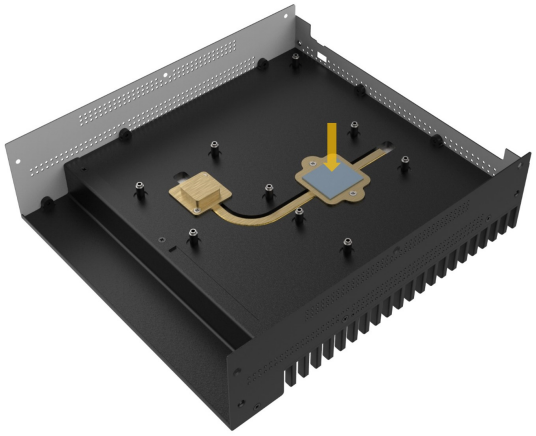


Figure 3-4: CPU thermal pad Installation

Step 5: Align the motherboard (together with the motherboard holder) with the 4 positioning rods on the 2 sides, place it on the heat sink, and lock the 11 spring screws on the motherboard. (**Figure 3-5**)

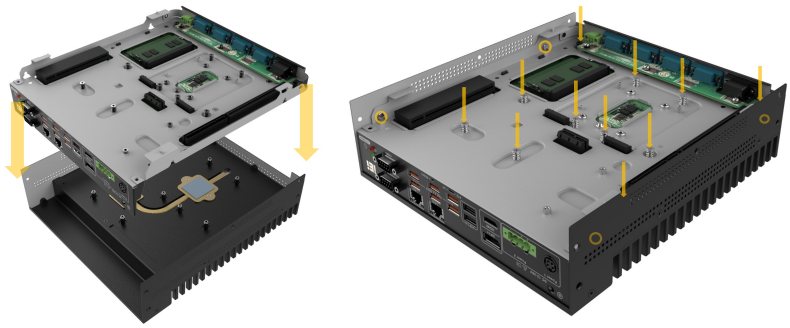


Figure 3-5: Motherboard Installation

Insert the memory into the motherboard memory slot and press it into place(

Step 6: **Figure 3-6**)

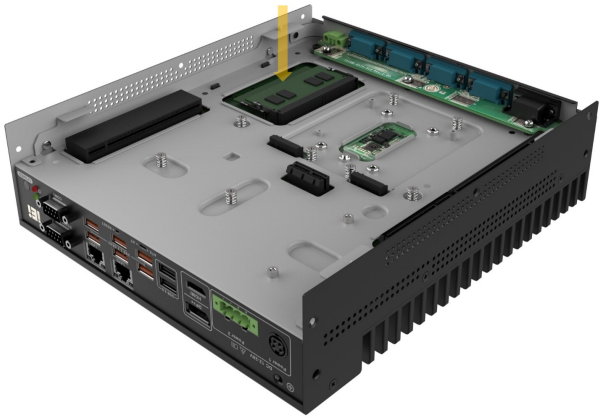


Figure 3-6: RAM Installation

Step 7: Remove the M.2 2280 reserved screws, install the M.2 2280 NVME card, and re-lock the fixing screws (

Step 8: **Figure 3-7**)

Figure 3-7: M.2 Installation

Step 9: Place the hard drive into the hard drive bracket and secure the HDD bracket and secure the hard drive with four screws (Figure 3-8)

Figure 3-8: HDD Installation

Install the back cover. And lock the 6 screws on the side (

Step 10: **Figure 3-9**)

Figure 3-9: Back cover Installation

3.3 Mounting the System with Mounting Brackets

To mount the embedded system onto a wall or some other surface using the two mounting brackets, please follow the steps below.

Step 1: Turn the embedded system over.

Step 2: Align the retention screw holes in each bracket with the corresponding retention screw holes on the bottom surface

Step 3: Secure the brackets to the system by inserting retention screws into each bracket (Figure 3-10Figure 3-10).

Figure 3-10: Mounting Bracket Retention Screws

Step 4: Drill holes in the intended installation surface.

Step 5: Align the mounting holes in the sides of the mounting brackets with the predrilled holes in the mounting surface.

Step 6: Insert four retention screws, three in each bracket, to secure the system to the wall.

3.4 External Peripheral Interface Connectors

The TANK-XM810 Series has the following connectors. Detailed descriptions of the connectors can be found in the subsections below.

- AT/ATX power mode switch

- Digital I/O
- Ethernet
- Power button
- Power DC jack
- Power terminal block
- HDMI
- DP++
- RS-232/422/485
- USB

3.4.1 AT/ATX Power Mode Selection

The TANK-XM810 Series supports AT and ATX power modes. The setting can be made through the AT/ATX power mode switch on the external peripheral interface panel as shown below (Figure 3-11)..

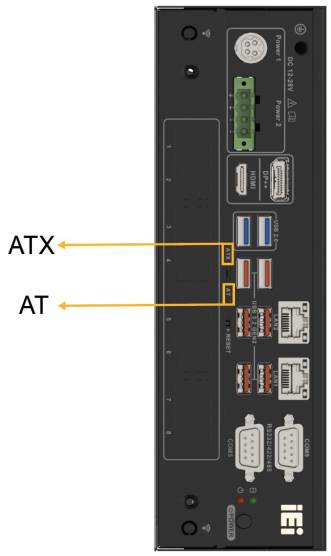


Figure 3-11: AT/ATX Power Mode Switch

3.4.2 SYS_FAN Connector

The sys_fan connector can be connected to an external expansion fan (Figure 3-12).

Figure 3-12: SYS_FAN Connector

3.4.3 Digital Input / Output Connector

The digital I/O connector provides programmable input and output for external devices. The pinouts for the digital I/O connector are listed in the table below(Table 3-1)(Figure 3-13).

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	DIN0
3	DIN1	4	DIN2
5	DIN3	6	DIN4
7	DIN5	8	GND
9	DOUT0	10	DOUT1
11	DOUT2	12	DOUT3
13	DOUT4	14	DOUT5
15	+5VS		

Table 3-1: Digital I/O Connector Pinouts

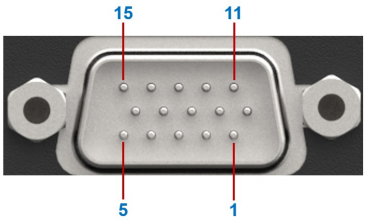


Figure 3-13: DIO Connector

3.4.4 HDMI/DP Connector

To connect the HDMI/DP devices, please plug in HDMI/DP connector in the right direction as shown below:

Figure 3-14: HDMI/DP Connection

3.4.5 LAN Connectors

The LAN connectors allow connection to an external network.

Step 1: **Locate the RJ-45 connectors**. The locations of the RJ-45 connectors are shown in 错误!未找到引用源。.

Step 2: **Align the connectors.** Align the RJ-45 connector on the LAN cable with one of the RJ-45 connectors on the TANK-XM810 Series. See Figure 3-15.

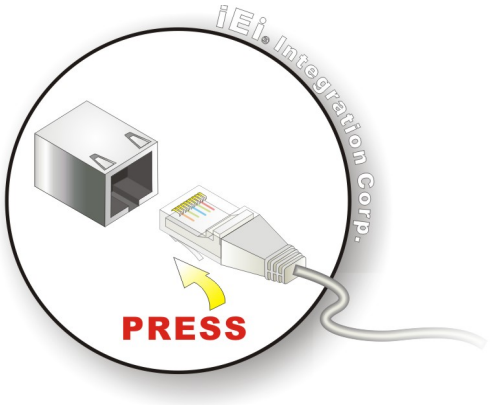


Figure 3-15: LAN Connection

Step 3: **Insert the LAN cable RJ-45 connector.** Once aligned, gently insert the LAN cable RJ-45 connector into the on-board RJ-45 connector.

Figure 3-16: RJ-45 Ethernet Connector

The RJ-45 Ethernet connector has two status LEDs, one green and one yellow. The green LED indicates activity on the port and the yellow LED indicates the port is linked. See Table 3-2

Activity/Link LED		Speed LED	
STATUS	**DESCRIPTION**	**STATUS**	**DESCRIPTION**
Off	No link	Off	100 Mbps connection
SSYellow	Linked	Orange	1 Gbp connection
Blinking	TX/RX activity	Green	2.5 Gbps connection

Table 3-2: RJ-45 Ethernet Connector LEDs

3.4.6 Power Input, 4-pin Terminal Block

The power connector connects the leads of a 12 V~28 V DC power supply into the terminal block. Make sure that the power and ground wires are attached to the correct sockets of the connector(Figure 3-17).

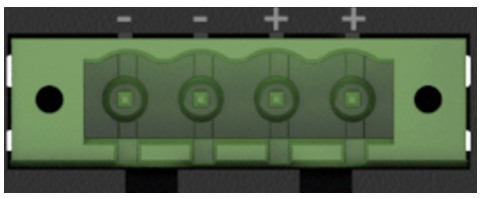


Figure 3-17: 4-pin Terminal Block

3.4.7 Power Input, 4-pin DIN Connector

The power connector connects to the 12 V~28 V DC power adapter(Figure 3-18).

Figure 3-18: Power Input Connector

3.4.8 DB-9 RS-232/422/485 Serial Port Connectors

The system has Two RS-232/422/485 & Four RS232 serial port connectors. The pinouts for the serial ports are listed in the table below(错误!未找到引用源。)(Figure 3-19).

PIN NO.	RS232	RS422	RS485
1	DCD#	TX-	TX-
2	RXD	TX+	TX+
3	TXD	RX+	
4	DTR#	RX-	
5	GND		
6	DSR#		
7	RTS#		
8	CTS#		
9	RI#		

Table 3-3: RS-232 (COM1~COM4),RS-232/422/485(COM5~COM6) Connector

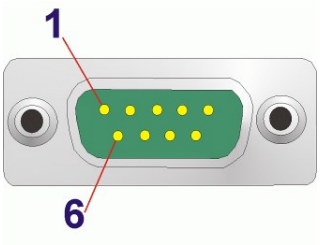


Figure 3-19: DB-9 RS-232/422/485 Serial Port Connector

3.4.9 Remote Power Connector

This remote power switch connector can be connected to an external switch for remote control of power on and off(Figure 3-20)

Figure 3-20: Remote Power Connector

3.5 Powering On/Off the System

WARNING:

Make sure a power supply with the correct input voltage is being fed into the system. Incorrect voltages applied to the system may cause damage to the internal electronic components and may also cause injury to the user.

- **Power on** the system: press the power button for 3 seconds
- **Power off** the system: press the power button for 6 seconds
- The power of this system can be less than 250w-20A.

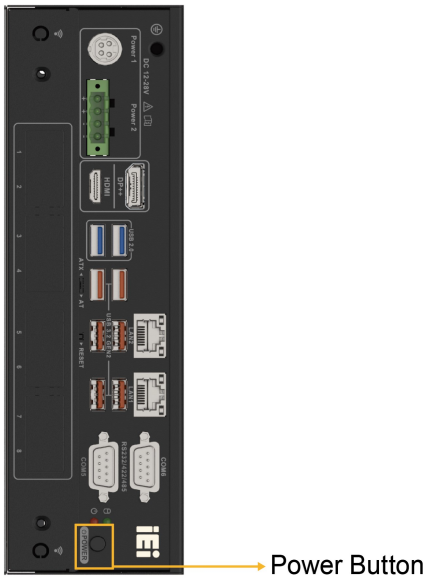


Figure 3-21: Power Button

3.6 Power

There are two power connectors on the rear panel. Power 1 connector is a 3-pin terminal block that supports ACC On signal. Power 2 connector is a DIN connector that can directly connect to a power adapter. The supported power input voltages are:

- **Power 1 (terminal block)**: 12 V ~ 28 V
- **Power 2 (DC jack)**: 12 V ~ 28 V

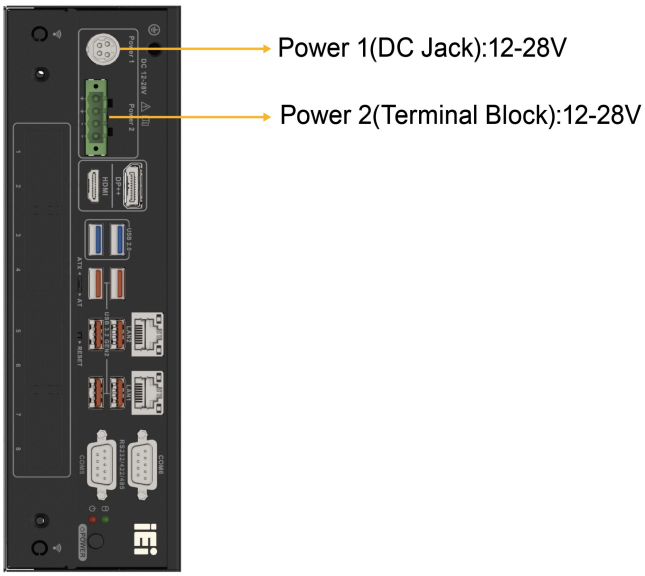


Figure 3-22: Power Connectors

LED Indicator	Description
Power LED1 (Breathing Orange)	Standby mode.
Power LED2 (Solid blue)	Power-on mode.

Table 3-4: Power LED Indicators Description

NOTE:

The power LED turns off when the power cable is unplugged from the system.

3.7 Available Drivers

All the drivers for the TANK-XM810 Series are available on IEI Resource Download Center (https://download.ieiworld.com). Type TANK-XM810 Series and press Enter to find all the relevant software, utilities, and documentation.

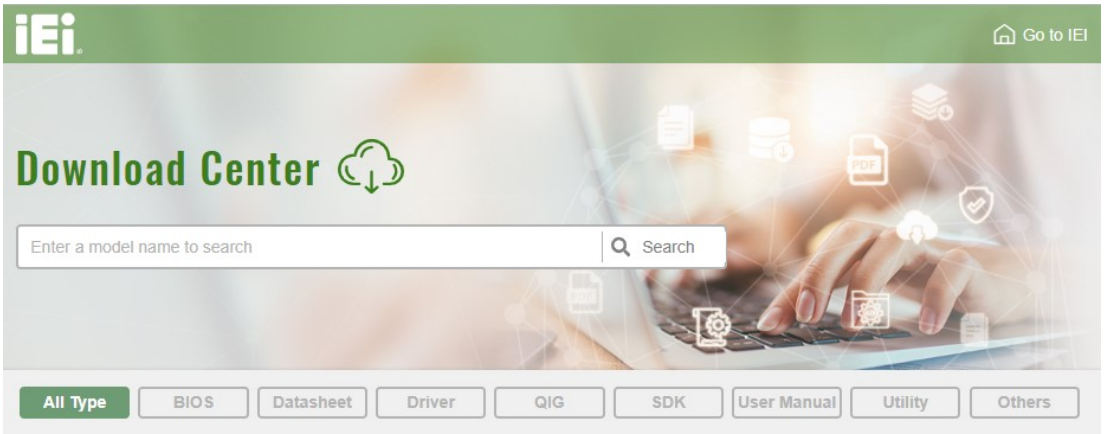
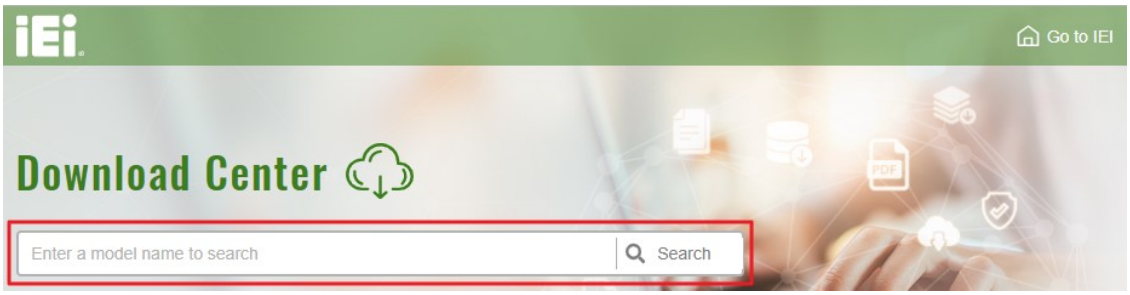


Figure 3-23: IEI Resource Download Center

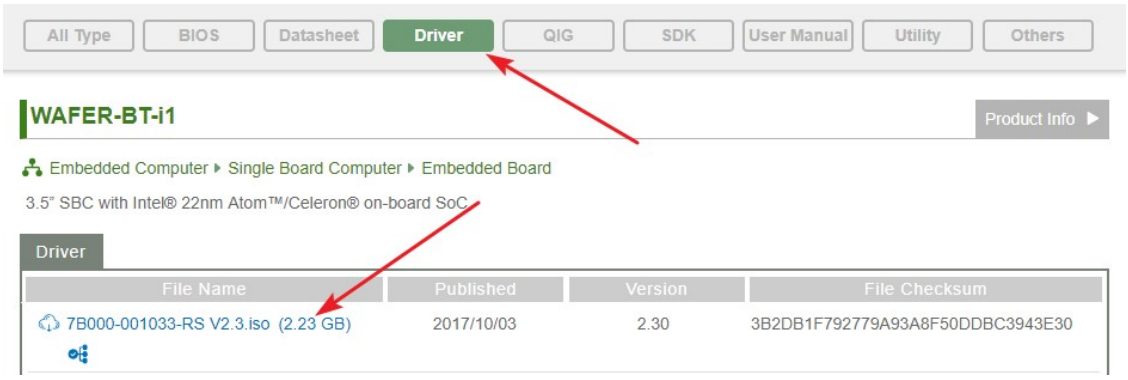
3.7.1 Driver Download

To download drivers from IEI Resource Download Center, follow the steps below.

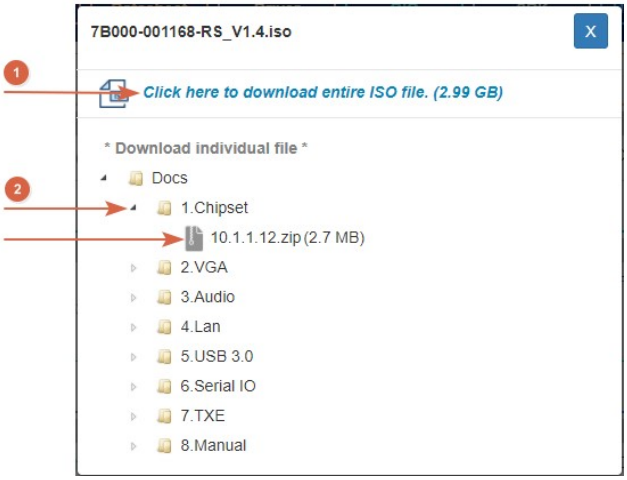
Step 1: Go to https://download.ieiworld.com. Type TANK-XM810 Series and press Enter.



Step 2: All product-related software, utilities, and documentation will be listed. You can choose **Driver** to filter the result.



Step 3: Click the driver file name on the page and you will be prompted with the following window. You can download the entire ISO file (❶), or click the small arrow to find an individual driver and click the file name to download (❷).



NOTE:

To install software from the downloaded ISO image file in Windows 10 (or later), double-click the ISO file to mount it as a virtual drive to view its content.

3.8 Maintenance

To configure the jumper settings, please follow the steps below.

Step 1: Remove the top cover. See Figure 3-2.

Step 2: Locate the jumper on the embedded motherboard.

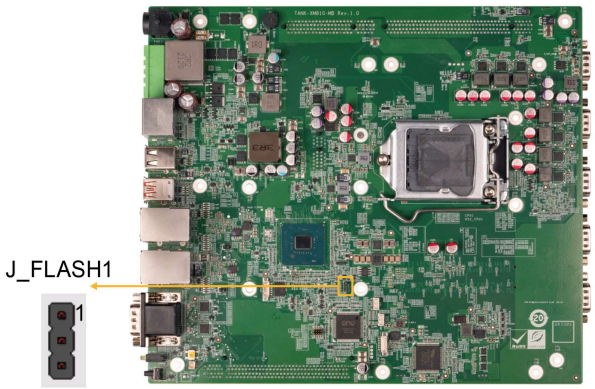
Step 3: Make the jumper settings in accordance with the settings described and defined in the following sections.

3.8.1 Flash Descriptor Security Override Jumper

The 1-2 Descriptor Security Override jumper (J_FLASH1) allows users to enable or disable the ME firmware update. Refer to 错误!未找到引用源。 and Table 3-5 for the jumper location and settings.

Setting	Description
Short 1-2	Disabled (default)
Short 2-3	Enabled

Table 3-5: Flash Descriptor Security Override Jumper Settings



To update the ME firmware, please follow the steps below.

Step 4: Before turning on the system power, short the Flash Descriptor Security Override jumper.

Step 5: Update the BIOS and ME firmware, and then turn off the system power.

Step 6: Remove the metal clip on the Flash Descriptor Security Override jumper or return to its default setting (open).

Step 7: Restart the system. The system will reboot to complete the ME firmware update.、

Chapter

4

System Motherboard

4.1 Overview

This chapter details all the jumpers and connectors of the system motherboard.

4.1.1 Layout

The figures below show all the connectors and jumpers of the system motherboard.

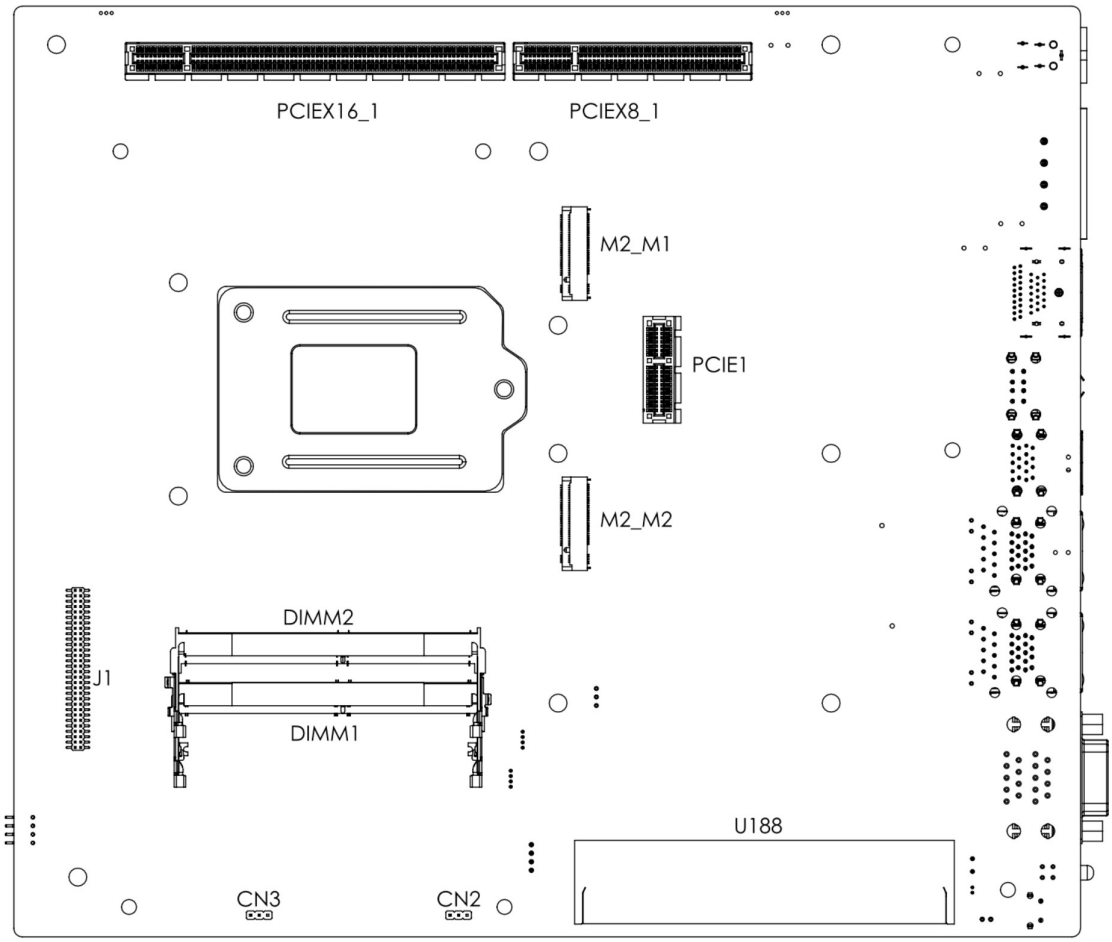
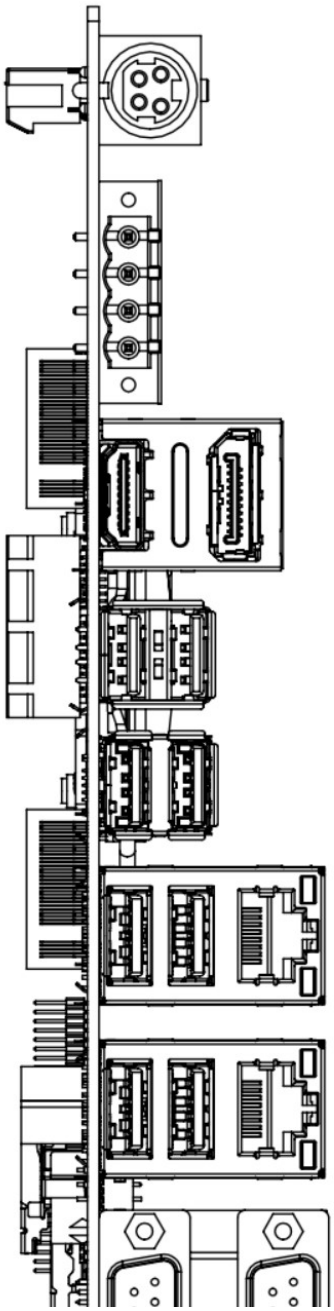
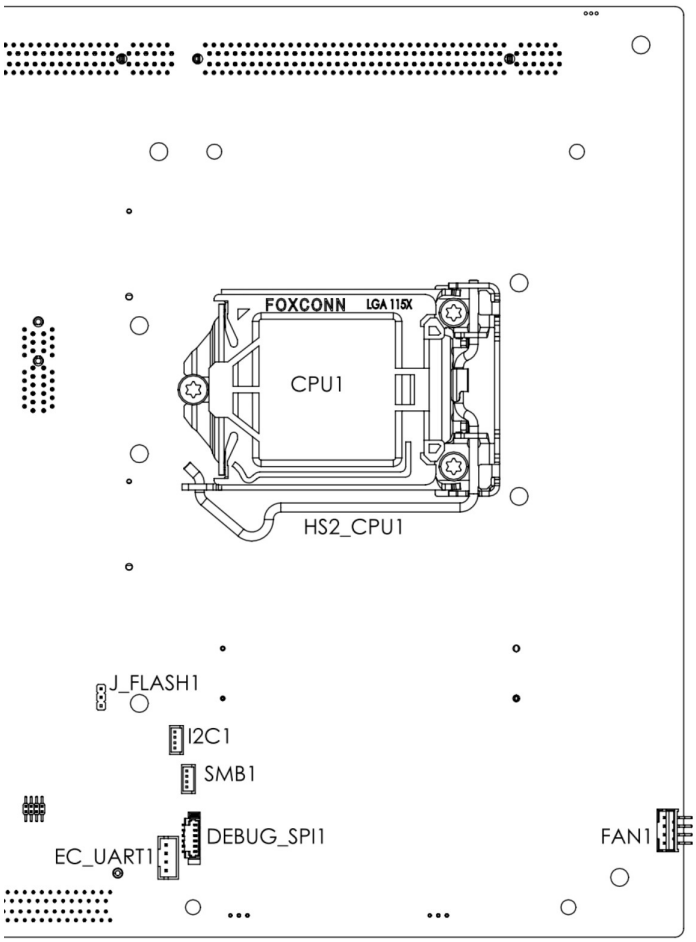
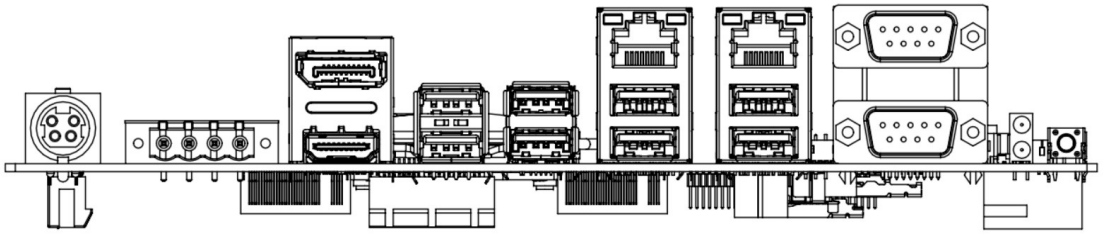


Figure 4-1: System Motherboard (Front)




FOXCONN LGA 115X
CPU1
HS2_CPU1
J_FLASH1
I2C1
SMB1
DEBUG_SPI1
EC_UART1
FAN1

Rear)



4.2 Internal Peripheral Connectors

The table below shows a list of the internal peripheral interface connectors on the system motherboard. Pinouts of these connectors can be found in the following sections.

Connector	Type	Label
Clear CMOS Switch	4-pin Switch	J_CMOS1
Battery connector	2-pin header	BAT1
Power button connector	2-pin header	PWR_BTN1
BIOS programmer connector	6-pin box header	J_SPI1
EC programmer connector	8-pin header	EC_JSP1
EC debug card connector	6-pin box header	DBG _JSP1
EC UART connector	4-pin box header	EC_UART1
Flash Override jumper	3-pin header	J_FLASH1
I2C BUS connector	4-pin box header	I2C1
SMBUS connector	4-pin box header	SMBUS1
M.2 slot (PCIe x2 interface)	M.2 M-key slot	M2_M1
M.2 slot (PCIe x2 interface)	M.2 M-key slot	M2_M2
HDD backplane connector	PCIE x1 slot	PCIEX1_1
DDR4 memory slot	DDR4 memory slot	DIMM1, DIMM2
PCIe backplane connector	backplane connector	PCIEX16_1, PCIEX8_1
PCIe IO Board connector	PCIe x16 slot	U188
THERMAL SENSOR CONN	3-pin Connector	CN2,CN3

Table 4-1: Peripheral Interface Connectors

4.2.1 Clear CMOS Switch(J_CMOS1)

PIN NO.	DESCRIPTION
Open	Normal Operation (Default)
Push	Clear CMOS Setup

Table 4-2: Clear CMOS Switch (J_CMOS1)

4.2.2 SMBUS Connector (J_AT_ATX1)

PIN NO.	DESCRIPTION
Short 1 - 2	ATX Mode (default)
Short 2- 3	AT Mode

Table 4-3: AT/ATX Mode Switch (J_AT_ATX1)

4.2.3 BIOS Programming Connector (JSPI1)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+V3.3M_SPI_CON	2	SPI_CS#0_SW
3	SPI_SO_SW	4	SPI_CLK_SW
5	SPI_SI_SW	6	GND

Table 4-4: BIOS Programming Connector Pinouts (JSPI1)

4.2.4 Power Button Pin Header (PWR_BTN1)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	PWRBTN_SW#	2	GND

Table 4-5: Power Button Pin Header (PWR_BTN1)

4.2.5 EC Programmer Connector (EC_SPI1)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	EC_SPI_CS#_R	2	+V3.3A_EC
3	EC_SPI_MISO_R	4	NC
5	EC_DET_FLASH	6	EC_SPI_CLK_R
7	GND	8	EC_SPI_MOSI_R

Table 4-6: EC Programmer Connector (J_SPI1)

4.2.6 EC UART Debug (EC_UART1)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION

1	DEBUG_UART_TX	2	+V3.3A_EC
3	DEBUG_UART_RX	4	GND

Table 4-7: EC UART Debug Connector (EC_UART1)

4.2.7 EC Debug Card Connector (DBG1_SPI1)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	NC	2	EDICS
3	EDIDO	4	EDICLK
5	EDIDI	6	GND

Table 4-8: EC Debug Card Connector (EC_DBG1)

4.2.8 System Fan Connectors (FAN1)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	VCC12V
3	FANIO	4	PWM

Table 4-9: System Fan Connectors (SYS_FAN1/SYS_FAN2)

4.2.9 LAN LED Connector (LED_LAN1/LED_LAN2/LED_LAN3)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	VCC3V	2	ACT

Table 4-10: LAN LED Connector

4.2.10 Battery Connector(BAT1)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	VBATT	2	GND

Table 4-11: Battery Connector (BAT1)

4.3 External Interface Panel Connectors

The table below shows a list of the external interface panel connectors on the system motherboard. Pinouts of these connectors can be found in the following sections.

Connector	Type	Label
Power input connector	4-pin DC jack	Power 1
Power input connector	4-pin terminal block	Power 2
DP and HDMI Connector	DisplayPorts, HDMI	DP++ HDMI
USB 2.0	USB 2.0	USB 2.0
USB 3.2 Gen 2	USB 3.2 Gen 2	USB 3.2 Gen 2
Ethernet and USB 3.2 Gen 2 combo connectors	RJ-45, USB 3.2 Gen 2 Type A	LAN1_USB1, LAN1_USB2,
RS-232/422/485 connector	DB-9	COM5, COM6
RESET Switch	4-pin Switch	RESET
AT/ATX mode switch	2-pin Switch	AT/ATX
HDD+System LED	HDD+System LED	HDD_PWR
Power button connector	4-pin Switch	POWER
RS-232 connector	DB-9	COM1, COM2, COM3, COM4
SYS_FAN connector	4-pin box header	SYS_FAN
Digital I/O connector	DB-15	DIO
Remote Power connector	2-pin terminal block	Remote Power

Table 4-12: Rear Panel Connectors

4.3.1 LAN Connectors

Pin	Description	Pin	Description
1	MDIA3-	5	MDIA1+
2	MDIA3+	6	MDIA2+

Pin	Description	Pin	Description
3	MDIA2-	7	MDIA0-
4	MDIA1-	8	MDIA0+

Table 4-13: Ethernet Connector Pinouts

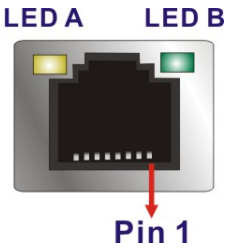


Figure 4-3: Ethernet Connector

LED	Description	LED	Description
A	on: linked blinking: data is being sent/received	B	off: 10 Mb/s green: 100 Mb/s orange: 1000 Mb/s

Table 4-14: Connector LEDs

4.3.2 Power Input Connector, DC Jack (PWR1)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	DC_IN1	2	GND
3	DC_IN1	4	GND
5	GND		

Table 4-15: Power Input Connector (PWR1)

4.3.3 Power Input Connector, Terminal Block (PWR2)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	DC_IN2	2	DC_IN2
3	GND	4	GND

Table 4-16: Power Input Connector (PWR2)

Appendix

A

Regulatory Compliance

DECLARATION OF CONFORMITY

CE

This equipment is in conformity with the following EU directives:

- EMC Directive (2004/108/EC, 2014/30/EU)
- Low-Voltage Directive (2006/95/EC, 2014/35/EU)
- RoHS II Directive (2011/65/EU, 2015/863/EU)

If the user modifies and/or install other devices in the equipment, the CE conformity declaration may no longer apply.

If this equipment has telecommunications functionality, it also complies with the requirements of the Radio Equipment Directive 2014/53/EU.

English
IEI Integration Corp declares that this equipment is in compliance with the essential requirements and other relevant provisions of Directive 2014/53/EU.
Български [Bulgarian]
IEI Integration Corp. декларира, че този оборудване е в съответствие със съществените изисквания и другите приложими правила на Директива 2014/53/EU.
Česky [Czech]
IEI Integration Corp tímto prohlašuje, že tento zařízení je ve shodě se základními požadavky a dalšími příslušnými ustanoveními směrnice 2014/53/EU.
Dansk [Danish]
IEI Integration Corp erklærer herved, at følgende udstyr overholder de væsentlige krav c øvrige relevante krav i direktiv 2014/53/EU.
Deutsch [German]
IEI Integration Corp, erklärt dieses Gerät entspricht den grundlegenden Anforderungen und den weiteren entsprechenden Vorgaben der Richtlinie 2014/53/EU.

Eesti [Estonian]

IEI Integration Corp deklareerib seadme seadme vastavust direktiivi 2014/53/EÜ põhinõuetele ja nimetatud direktiivist tulenevatele teistele asjakohastele sätetele.

Español [Spanish]

IEI Integration Corp declara que el equipo cumple con los requisitos esenciales y cualesquiera otras disposiciones aplicables o exigibles de la Directiva 2014/53/EU.

Ελληνική [Greek]

IEI Integration Corp ΔΗΛΩΝΕΙ ΟΤΙ ΕΞΟΠΛΙΣΜΟΣ ΣΥΜΜΟΡΦΩΝΕΤΑΙ ΠΡΟΣ ΤΙΣ ΟΥΣΙΩΔΕΙΣ ΑΠΑΙΤΗΣΕΙΣ ΚΑΙ ΤΙΣ ΛΟΙΠΕΣ ΣΧΕΤΙΚΕΣ ΔΙΑΤΑΞΕΙΣ ΤΗΣ ΟΔΗΓΙΑΣ 2014/53/EU.

Français [French]

IEI Integration Corp déclare que l'appareil est conforme aux exigences essentielles et aux autres dispositions pertinentes de la directive 2014/53/EU.

Italiano [Italian]

IEI Integration Corp dichiara che questo apparecchio è conforme ai requisiti essenziali ed alle altre disposizioni pertinenti stabilite dalla direttiva 2014/53/EU.

Latviski [Latvian]

IEI Integration Corp deklarē, ka iekārta atbilst būtiskajām prasībām un citiem ar to saistītajiem noteikumiem Direktīvas 2014/53/EU.

Lietuvių [Lithuanian]

IEI Integration Corp deklaruoja, kad šis įranga atitinka esminius reikalavimus ir kitas 2014/53/EU Direktyvos nuostatas.

Nederlands [Dutch]

IEI Integration Corp dat het toestel toestel in overeenstemming is met de essentiële eisen en de andere relevante bepalingen van richtlijn 2014/53/EU.

Malti [Maltese]

IEI Integration Corp jiddikjara li dan prodott jikkonforma mal-ħtiġijiet essenzjali u ma provvedimenti oħrajn relevanti li hemm fid-Dirrettiva 2014/53/EU.

Magyar [Hungarian]

IEI Integration Corp nyilatkozom, hogy a berendezés megfelel a vonatkozó alapvetõ követelményeknek és az 2014/53/EU irányelv egyéb elõírásainak.

Polski [Polish]

IEI Integration Corp oświadcza, że wyrobu jest zgodny z zasadniczymi wymogami oraz pozostałymi stosownymi postanowieniami Dyrektywy 2014/53/EU.

Português [Portuguese]

IEI Integration Corp declara que este equipamento está conforme com os requisitos essenciais e outras disposições da Directiva 2014/53/EU.

Româna [Romanian]

IEI Integration Corp declară că acest echipament este in conformitate cu cerinţele esenţiale şi cu celelalte prevederi relevante ale Directivei 2014/53/EU.

Slovensko [Slovenian]

IEI Integration Corp izjavlja, da je ta opreme v skladu z bistvenimi zahtevami in ostalimi relevantnimi določili direktive 2014/53/EU.

Slovensky [Slovak]

IEI Integration Corp týmto vyhlasuje, že zariadenia spĺňa základné požiadavky a všetky príslušné ustanovenia Smernice 2014/53/EU.

Suomi [Finnish]

IEI Integration Corp vakuuttaa täten että laitteet on direktiivin 2014/53/EU oleellisten vaatimusten ja sitä koskevien direktiivin muiden ehtojen mukainen.

Svenska [Swedish]

IEI Integration Corp förklarar att denna utrustningstyp står I överensstämmelse med de väsentliga egenskapskrav och övriga relevanta bestämmelser som framgår av direktiv 2014/53/EU.

FCC WARNING

This equipment complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference, and
- This device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Federal Communication Commission Interference Statement

This equipment has been assembled with components that comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Appendix

B

Terminology

AC ’97	Audio Codec 97 (AC’97) refers to a codec standard developed by Intel® in 1997.
ACPI	Advanced Configuration and Power Interface (ACPI) is an OS-directed configuration, power management, and thermal management interface.
AHCI	Advanced Host Controller Interface (AHCI) is a SATA Host controller register-level interface.
ATA	The Advanced Technology Attachment (ATA) interface connects storage devices including hard disks and CD-ROM drives to a computer.
ARMD	An ATAPI Removable Media Device (ARMD) is any ATAPI device that supports removable media, besides CD and DVD drives.
ASKIR	Amplitude Shift Keyed Infrared (ASKIR) is a form of modulation that represents a digital signal by varying the amplitude (“volume”) of the signal. A low amplitude signal represents a binary 0, while a high amplitude signal represents a binary 1.
BIOS	The Basic Input/Output System (BIOS) is firmware that is first run when the computer is turned on and can be configured by the end user
CODEC	The Compressor-Decompressor (CODEC) encodes and decodes digital audio data on the system.
CompactFlash®	CompactFlash® is a solid-state storage device. CompactFlash® devices use flash memory in a standard size enclosure. Type II is thicker than Type I, but a Type II slot can support both types.
CMOS	Complimentary metal-oxide-conductor is an integrated circuit used in chips like static RAM and microprocessors.
COM	COM refers to serial ports. Serial ports offer serial communication to expansion devices. The serial port on a personal computer is usually a male D-sub 9 connector.
DAC	The Digital-to-Analog Converter (DAC) converts digital signals to analog signals.
DDR	Double Data Rate refers to a data bus transferring data on both the rising and falling edges of the clock signal.

DMA	Direct Memory Access (DMA) enables some peripheral devices to bypass the system processor and communicate directly with the system memory.
DIMM	Dual Inline Memory Modules are a type of RAM that offer a 64-bit data bus and have separate electrical contacts on each side of the module.
DIO	The digital inputs and digital outputs are general control signals that control the on/off circuit of external devices or TTL devices. Data can be read or written to the selected address to enable the DIO functions.
EHCI	The Enhanced Host Controller Interface (EHCI) specification is a register-level interface description for USB 2.0 Host Controllers.
EIDE	Enhanced IDE (EIDE) is a newer IDE interface standard that has data transfer rates between 4.0 MBps and 16.6 MBps.
EIST	Enhanced Intel® SpeedStep Technology (EIST) allows users to modify the power consumption levels and processor performance through application software. The application software changes the bus-to-core frequency ratio and the processor core voltage.
FSB	The Front Side Bus (FSB) is the bi-directional communication channel between the processor and the Northbridge chipset.
GbE	Gigabit Ethernet (GbE) is an Ethernet version that transfers data at 1.0 Gbps and complies with the IEEE 802.3-2005 standard.
GPIO	General purpose input
HDD	Hard disk drive (HDD) is a type of magnetic, non-volatile computer storage device that stores digitally encoded data.
ICH	The Input/Ouput Controll Hub (ICH) is an Intel® Southbridge chipset.
IrDA	Infrared Data Association (IrDA) specify infrared data transmission protocols used to enable electronic devices to wirelessly communicate with each other.
L1 Cache	The Level 1 Cache (L1 Cache) is a small memory cache built into the system processor.
L2 Cache	The Level 2 Cache (L2 Cache) is an external processor memory cache.

LCD	Liquid crystal display (LCD) is a flat, low-power display device that consists of two polarizing plates with a liquid crystal panel in between.
LVDS	Low-voltage differential signaling (LVDS) is a dual-wire, high-speed differential electrical signaling system commonly used to connect LCD displays to a computer.
POST	The Power-on Self Test (POST) is the pre-boot actions the system performs when the system is turned-on.
RAM	Random Access Memory (RAM) is volatile memory that loses data when power is lost. RAM has very fast data transfer rates compared to other storage like hard drives.
SATA	Serial ATA (SATA) is a serial communications bus designed for data transfers between storage devices and the computer chipsets. The SATA bus has transfer speeds up to 1.5 Gbps and the SATA II bus has data transfer speeds of up to 3.0 Gbps.
S.M.A.R.T	Self Monitoring Analysis and Reporting Technology (S.M.A.R.T) refers to automatic status checking technology implemented on hard disk drives.
UART	Universal Asynchronous Receiver-transmitter (UART) is responsible for asynchronous communications on the system and manages the system's serial communication (COM) ports.
UHCI	The Universal Host Controller Interface (UHCI) specification is a register-level interface description for USB 1.1 Host Controllers.
USB	The Universal Serial Bus (USB) is an external bus standard for interfacing devices. USB 1.1 supports 12Mbps data transfer rates and USB 2.0 supports 480Mbps data transfer rates.
VGA	The Video Graphics Array (VGA) is a graphics display system developed by IBM.

Appendix

C

Safety Precautions

C.1 Safety Precautions

WARNING:

The precautions outlined in this appendix should be strictly followed. Failure to follow these precautions may result in permanent damage to the TANK-XM810 Series.

Please follow the safety precautions outlined in the sections that follow:

C.1.1 General Safety Precautions

Please ensure the following safety precautions are adhered to at all times.

- ***Make sure the power is turned off and the power cord is disconnected*** when moving, installing or modifying the system.
- ***Do not apply voltage levels that exceed the specified voltage range***. Doing so may cause fire and/or an electrical shock.
- ***Electric shocks can occur*** if opened while still powered on.
- ***Do not drop or insert any objects*** into the ventilation openings.
- ***If considerable amounts of dust, water, or fluids enter the system***, turn off the power supply immediately, unplug the power cord, and contact the system vendor.
- **DO NOT**:
  - Drop the system against a hard surface.
  - In a site where the ambient temperature exceeds the rated temperature

C.1.2 Anti-static Precautions

WARNING:

Failure to take ESD precautions during the installation of the TANK-XM810 Series may result in permanent damage to the TANK-XM810 Series and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the TANK-XM810 Series. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the TANK-XM810 Series is opened and any of the electrical components are handled, the following anti-static precautions are strictly adhered to.

- ***Wear an anti-static wristband***: Wearing a simple anti-static wristband can help to prevent ESD from damaging any electrical component.
- ***Self-grounding***: Before handling any electrical component, touch any grounded conducting material. During the time the electrical component is handled, frequently touch any conducting materials that are connected to the ground.
- ***Use an anti-static pad***: When configuring or working with an electrical component, place it on an antic-static pad. This reduces the possibility of ESD damage.
- ***Only handle the edges of the electrical component***: When handling the electrical component, hold the electrical component by its edges.

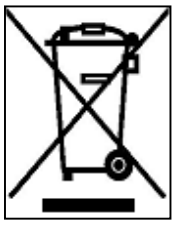
C.1.3 Product Disposal

CAUTION:

Risk of explosion if battery is replaced by and incorrect type. Only certified engineers should replace the on-board battery.

Dispose of used batteries according to instructions and local regulations.

- Outside the European Union – If you wish to dispose of used electrical and electronic products outside the European Union, please contact your local authority so as to comply with the correct disposal method.
- Within the European Union – The device that produces less waste and is easier to recycle is classified as electronic device in terms of the European Directive 2012/19/EU (WEEE), and must not be disposed of as domestic garbage.



EU-wide legislation, as implemented in each Member State, requires that waste electrical and electronic products carrying the mark (left) must be disposed of separately from normal household waste. This includes monitors and electrical accessories, such as signal cables or power cords. When you need to dispose of your display products, please follow the guidance of your local authority, or ask the shop where you purchased the product. The mark on electrical and electronic products only applies to the current European Union Member States.

Please follow the national guidelines for electrical and electronic product disposal.

C.2 Maintenance and Cleaning Precautions

When maintaining or cleaning the TANK-XM810 Series, please follow the guidelines below.

C.2.1 Maintenance and Cleaning

Prior to cleaning any part or component of the TANK-XM810 Series, please read the details below.

- The interior of the TANK-XM810 Series does not require cleaning. Keep fluids away from the TANK-XM810 Series interior.
- Be cautious of all small removable components when vacuuming the TANK-XM810 Series.
- Turn the TANK-XM810 Series off before cleaning the TANK-XM810 Series.
- Never drop any objects or liquids through the openings of the TANK-XM810 Series.
- Be cautious of any possible allergic reactions to solvents or chemicals used when cleaning the TANK-XM810 Series.
- Avoid eating, drinking and smoking within vicinity of the TANK-XM810 Series.

C.2.2 Cleaning Tools

Some components in the TANK-XM810 Series may only be cleaned using a product specifically designed for the purpose. In such case, the product will be explicitly mentioned in the cleaning tips. Below is a list of items to use when cleaning the TANK-XM810 Series.

- ***Cloth*** – Although paper towels or tissues can be used, a soft, clean piece of cloth is recommended when cleaning the TANK-XM810 Series.
- ***Water or rubbing alcohol*** – A cloth moistened with water or rubbing alcohol can be used to clean the TANK-XM810 Series.
- ***Using solvents*** – The use of solvents is not recommended when cleaning the TANK-XM810 Series as they may damage the plastic parts.
- ***Vacuum cleaner*** – Using a vacuum specifically designed for computers is one of the best methods of cleaning the TANK-XM810 Series. Dust and dirt can restrict the airflow in the TANK-XM810 Series and cause its circuitry to corrode.
- ***Cotton swabs*** - Cotton swaps moistened with rubbing alcohol or water are excellent tools for wiping hard to reach areas.
- ***Foam swabs*** - Whenever possible, it is best to use lint free swabs such as foam swabs for cleaning.

Appendix

D

Digital I/O Interface

D.1 Introduction

The DIO connector on the TANK-XM810 Series is interfaced to GPIO ports on the Super I/O chipset. The DIO has both 4-bit digital inputs and 4-bit digital outputs. The digital inputs and digital outputs are generally control signals that control the on/off circuit of external devices or TTL devices. Data can be read or written to the selected address to enable the DIO functions.

NOTE:

For further information, please refer to the datasheet for the Super I/O chipset.

The BIOS interrupt call **INT 15H** controls the digital I/O.

INT 15H:

AH – 6FH
Sub-function: AL – 8 :Set the digital port as INPUT AL :Digital I/O input value

D.2 Assembly Language Sample 1

```
MOV     AX, 6F08H       ;setting the digital port as input
INT     15H             ;
```

AL low byte = value

AH – 6FH
Sub-function: AL – 9 :Set the digital port as OUTPUT BL :Digital I/O input value

D.3 Assembly Language Sample 2

```
MOV     AX, 6F09H       ;setting the digital port as output
MOV     BL, 09H         ;digital value is 09H
INT     15H             ;
```

Digital Output is 1001b

Appendix

E

Error Beep Code

E.1 PEI Beep Codes

Number of Beeps	Description
1	Memory not Installed
1	Memory was installed twice (InstallPeiMemory routine in PEI Core called twice)
2	Recovery started
3	DXEIPL was not found
3	DXE Core Firmware Volume was not found
4	Recovery failed
4	S3 Resume failed
7	Reset PPI is not available

E.2 DXE Beep Codes

Number of Beeps	Description
1	Invalid password
4	Some of the Architectural Protocols are not available
5	No Console Output Devices are found
5	No Console Input Devices are found
6	Flash update is failed
7	Reset protocol is not available
8	Platform PCI resource requirements cannot be met

NOTE:

If you have any question, please contact IEI for further assistance.

Appendix

F

Hazardous Materials Disclosure

F.1 RoHS II Directive (2015/863/EU)

The details provided in this appendix are to ensure that the product is compliant with the RoHS II Directive (2015/863/EU). The table below acknowledges the presences of small quantities of certain substances in the product, and is applicable to RoHS II Directive (2015/863/EU).

Please refer to the following table.

Part Name	Toxic or Hazardous Substances and Elements									
	Lead (Pb)	Mercury (Hg)	Cadmium (Cd)	Hexavalent Chromium (CR(VI))	Polybrominated Biphenyls (PBB)	Polybrominated Diphenyl Ethers (PBDE)	Bis(2-ethylhexyl) phthalate (DEHP)	Butyl benzyl phthalate (BBP)	Dibutyl phthalate (DBP)	Diisobutyl phthalate (DIBP)
Housing	O	O	O	O	O	O	O	O	O	O
Printed Circuit Board	O	O	O	O	O	O	O	O	O	O
Metal Fasteners	O	O	O	O	O	O	O	O	O	O
Cable Assembly	O	O	O	O	O	O	O	O	O	O
Fan Assembly	O	O	O	O	O	O	O	O	O	O
Power Supply Assemblies	O	O	O	O	O	O	O	O	O	O
Battery	O	O	O	O	O	O	O	O	O	O

O: This toxic or hazardous substance is contained in all of the homogeneous materials for the part is below the limit requirement in Directive (EU) 2015/863.

X: This toxic or hazardous substance is contained in at least one of the homogeneous materials for this part is above the limit requirement in Directive (EU) 2015/863.

F.2 China RoHS

此附件旨在确保本产品符合中国 RoHS 标准。以下表格标示此产品中某有毒物质的含量符合中国 RoHS 标准规定的限量要求。

本产品上会附有"环境友好使用期限"的标签,此期限是估算这些物质"不会有泄漏或突变"的年限。本产品可能包含有较短的环境友好使用期限的可替换元件,像是电池或灯管,这些元件将会单独标示出来。

部件名称	有毒有害物质或元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (CR(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
壳体	O	O	O	O	O	O
印刷电路板	O	O	O	O	O	O
金属螺帽	O	O	O	O	O	O
电缆组装	O	O	O	O	O	O
风扇组装	O	O	O	O	O	O
电力供应组装	O	O	O	O	O	O
电池	O	O	O	O	O	O

O: 表示该有毒有害物质在该部件所有物质材料中的含量均在 SJ/T11364-2014 與 GB/T26572-2011 标准规定的限量要求以下。

X: 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 SJ/T11364-2014 與 GB/T26572-2011 标准规定的限量要求。